

I Claim:

1. A method for performing computer memory initialization comprising:
generating configuration data for a portion of memory;
saving the configuration data;
restarting computer memory initialization;
5 copying the saved configuration data to initialize the portion of memory;

and

using the portion of memory to execute instructions to initialize a remainder of memory.

2. A method as defined in claim 1 wherein:
the portion of memory comprises at least one memory module; and
the saving further comprises storing the configuration data in a nonvolatile memory device.
3. A method as defined in claim 2 wherein:
the nonvolatile memory device is associated with the memory module.

4. A method as defined in claim 1 wherein:
the restarting comprises a firmware initiated computer memory initialization; and
the method further comprises:
5 determining whether the computer memory initialization is initiated by firmware;
upon determining that the computer memory initialization is not initiated by firmware, performing the generating, saving and restarting; and
upon determining that the computer memory initialization is initiated by
10 firmware, performing the copying and using.

5. A method as defined in claim 1 further comprising:
creating a software stack in the portion of memory; and
using the software stack to execute stack-based instructions to initialize the remainder of memory.

6. A method as defined in claim 1 wherein:
the portion of memory comprises a first memory controller and first memory associated with the first memory controller;
the remainder of memory comprises a second memory controller and
5 second memory associated with the second memory controller; and

the copying further comprises copying the configuration data to the first memory controller to enable the first memory controller to use the first memory to execute the instructions to initialize the second memory controller and the second memory.

7. A method as defined in claim 6 wherein:

the first memory associated with the first memory controller comprises first and second memory modules, the first memory module comprising an associated nonvolatile memory space; and

5 the method further comprises:

initializing the first memory controller to use the first memory module;

using the first memory module to initialize the second memory module and generate the configuration data;

10 saving the configuration data in the nonvolatile memory space associated with the first memory module; and

copying the configuration data from the nonvolatile memory space associated with the first memory module to the first memory controller to enable the first memory controller to use the first and second memory modules to execute the instructions to initialize the second memory controller and the second memory.

8. A method for initializing computer memory comprising:

resetting a computer system;

determining whether the reset is firmware initiated;

5 upon determining that the reset is firmware initiated, copying saved configuration data to initialize a portion of the computer memory; and

using the portion of the computer memory to execute instructions to initialize a remainder of the computer memory.

9. A method as defined in claim 8 further comprising:

creating a software stack in the portion of the computer memory.

10. A method as defined in claim 9 wherein:

the copying is performed using stackless instructions; and

the instructions executed to initialize the remainder of the computer memory are stack-based instructions.

11. A method as defined in claim 8 further comprising:

upon determining that the reset is not firmware initiated, generating and

saving the configuration data and causing a firmware initiated reset of the computer system.

12. A method as defined in claim 11 further comprising:
saving the configuration data in a nonvolatile memory

13. A method as defined in claim 12 wherein:
the nonvolatile memory is associated with the portion of the computer memory.

14. A method for initializing computer memory, comprising:
resetting a computer system;
determining whether the reset is firmware initiated;
upon determining that the reset is not firmware initiated:

5 initializing a first memory controller and a first portion of a
computer memory associated with the first memory controller using stackless code;
 creating a first stack in the first portion of the computer memory
associated with the first memory controller;

10 initializing the first memory controller and a second portion of the
computer memory associated with the first memory controller using stack-based code;
 saving configuration data for the first memory controller in a
nonvolatile memory of the first portion of the computer memory associated with the
first memory controller;

15 setting a firmware reset flag; and
 resetting the computer system;

 upon determining that the reset is firmware initiated according to the
firmware reset flag:

 copying the saved configuration data from the nonvolatile memory
to the first memory controller;

20 creating a second stack in the computer memory associated with
the first memory controller; and

 initializing a second memory controller and a computer memory
associated with the second memory controller using stack-based code.

15. A computer system, comprising:
a memory controller;
first and second computer memory associated with the memory
controller;

5 stackless instructions; and
 stack-based instructions;
 and wherein:
 under control of the stackless instructions the computer system
initializes the first computer memory for use by the memory controller; and
10 under control of the stack-based instructions the computer system
assembles configuration data which enables the memory controller to use the first and
second computer memory.

16. A computer system, comprising:
 a memory controller;
 first and second memory modules;
 a nonvolatile memory space; and
5 firmware, under control of which the computer system:
 initializes the memory controller to use the first memory module;
 generates configuration data that enables the memory controller
to use the first and second memory modules;
 saves the configuration data in the nonvolatile memory space;
10 and
 copies the configuration data from the nonvolatile memory space
to the memory controller to initialize the memory controller to use the first and second
memory modules.

17. A computer system as defined in claim 16 wherein the aforementioned
memory controller is a first memory controller, further comprising:
 a second memory controller;
 a first computer memory comprising the first and second memory
5 modules; and
 a second computer memory;
 and wherein:
 under further control of the firmware the computer system:
 initiates a reset after saving the configuration data in the
10 nonvolatile memory space;
 after the reset, configures the first memory controller to use the
first computer memory upon copying the configuration data from the nonvolatile
memory space to the memory controller; and

- 15 after the first memory controller is configured to use the first
computer memory, configures the second memory controller to use the second
computer memory.
18. A computer system, comprising:
first and second memory controllers;
first and second computer memory associated with the first and second
memory controllers, respectively;
5 a nonvolatile memory space; and
firmware under control of which the computer system generates
configuration data that enables the first memory controller to use the first computer
memory, saves the configuration data in the nonvolatile memory space, copies the
configuration data to the first memory controller to initialize the first memory controller
10 to use the first computer memory, and uses the first computer memory to initialize the
second memory controller to use the second computer memory.
19. A computer system as defined in claim 18 wherein:
the nonvolatile memory space is associated with the first computer
memory.
20. A computer system as defined in claim 18 wherein:
under control of the firmware:
the computer system initiates a reset after saving the configuration data;
the computer system determines whether a current reset is firmware
5 initiated;
if the current reset is firmware initiated, the computer system copies the
configuration data to the first memory controller to initialize the first memory controller
to use the first computer memory, and uses the first computer memory to initialize the
second memory controller to use the second computer memory; and
10 if the current reset is not firmware initiated, the computer system
generates the configuration data that enables the first memory controller to use the
first computer memory, and saves the configuration data in the nonvolatile memory
space.
21. A computer system comprising:
first and second memory controllers;
first and second computer memory associated with the first and second
memory controllers, respectively; and

- 5 firmware comprising stackless instructions and stack-based instructions;
and wherein:
under control of the stackless instructions the computer system
initializes the first memory controller to use the first computer memory; and
under control of the stack-based instructions the computer system
10 initializes the second memory controller to use the second computer memory.
22. A computer system as defined in claim 21 wherein:
under control of the stackless instructions the computer system creates
a software stack in the first computer memory to be used under control of the stack-
based instructions.
23. A computer system as defined in claim 21 further comprising:
a nonvolatile memory space;
and wherein:
the first computer memory comprises first and second memory modules;
5 under control of the stackless instructions the computer system
initializes the first memory module for use by the first memory controller and creates a
temporary software stack in the first memory module; and
under control of the stack-based instructions the computer system uses
the temporary software stack, generates configuration data that enables the first
10 memory controller to use the first and second memory modules, saves the
configuration data in the nonvolatile memory space, and executes a firmware initiated
reset.
24. A computer system as defined in claim 23 wherein:
under control of the stackless instructions the computer system detects
the firmware initiated reset, copies the configuration data to the first memory
controller, and creates a permanent software stack in the first computer memory; and
5 under control of the stack-based instructions the computer system uses
the permanent software stack and initializes the second computer memory for use by
the second memory controller.
25. A computer system comprising:
first and second computer memory;
first and second means for controlling the first and second computer
memory, respectively;
5 a means for generating configuration data that enables the first

controlling means to use the first computer memory;

a means for storing the configuration data during a firmware initiated reset;

a means for executing the firmware initiated reset;

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a means using stackless instructions upon a firmware initiated reset for copying the configuration data from the storing means to the first controlling means to use the first computer memory;

a means for creating a software stack in the first computer memory; and

a means using stack-based instructions for initializing the second

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controlling means to use the second computer memory.